Appl. No. 09/839,044
Reply to Office Action filed: October 12, 2005
Office Action mailed: July 12, 2005

<div align="center">REMARKS</div>

In response to the Office Action dated July 12, 2005, the Applicant submits this Reply.
In view of the foregoing amendments and following remarks, reconsideration is requested.

Claims 1-14 and 17-20 remain in this application, of which claims 1 and 8 are
independent. Claims 19 and 20 are new. No fee is due for claims for this amendment.

<div align="center">Rejection Under 35 U.S.C. §102</div>

Claims 1, 2, 8, 9, 17 and 18, of which claims 1 and 8 are independent, were rejected
under 35 U.S.C. §102 in view of U.S. Patent 6,246,961 ("Sasaki").

According to Sasaki, and in particular the portion relied upon in the Office Action (Col.
8, lines 29-46, with emphasis added):

> "The above-described procedure of the image processing and danger judgement
> according to this invention may be summarized as shown in FIG. 8. First, two
> images obtained by photographing the diagonal rear environment of the one
> vehicle at different times with the video camera 1 are each stored in a not-shown
> frame memory. Corresponding horizontal edges in the respective images are then
> detected with a correlation window. In other words, a correlation window is set
> for a noticeable horizontal edge in the previously obtained image, and the
> correlation window is used to detect the corresponding noticeable edge in the
> subsequently-obtained image. Optical flow is then detected from the horizontal
> edges. After optical flow has been detected, the time of collision is calculated
> from each optical flow. The danger of collision with the other vehicle, which
> approaches from the diagonal rear direction, is judged based on the calculated
> time of collision and an alarm is given based on the result."

This portion of Sasaki merely provides a high level summary of the operations performed
by Sasaki's system, without explaining how optical flow is calculated. Sasaki explains in more
detail, for example at Col. 4, lines 47-50, that optical flow is the speed vector obtained by
connecting two points that correspond to each other and that are from two images take at
different times. Thus, Sasaki teaches identifying two corresponding lines in two images taken a
different times and calculating the speed vectors between those two lines.

Both of the independent claims (1 and 8) require that the estimate of motion is computed
"using a gradient-based method . . . using the single channel images . . . and using as a constraint
that a total of the desired characteristic is constant from one image to a next image." Sasaki's

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computation of speed vectors is not a method that "uses as a constraint that a total of the desired characteristic is constant from one image to a next image." Whether applicant's implementation of optical flow described in this application uses such a constraint is irrelevant because Sasaki's technique does not use such a constraint. Accordingly, the rejection of independent claims 1 and 8 is traversed. The remaining claims are dependent claims that are allowable for at least the same reasons.

Moreover, the technique in Sasaki does not produce, for each pixel in an image, a vector that described the motion for the pixel from one image to the next. Accordingly, dependent claims 19 and 20 have been added which further distinguish the invention from Sasaki. Support for these claims is found at page 1, lines 5-6 of this application.

Rejections Under 35 U.S.C. §103

Dependent claims 4-6 and 11-13 were rejected under 35 U.S.C. §103 in view of Sasaki and U.S. Patent 4,924,310 ("Von Brandt"). Dependent claims 3 and 10 were rejected under 35 U.S.C. §103 in view of Sasaki and U.S. Patent Publication 2002/0159749A1 ("Kobilansky"). Dependent claims 7 and 14 were rejected under 35 U.S.C. §103 in view of Sasaki, Von Brandt and Kobilansky. These rejections are respectfully traversed as claims 3-7 and 10-14 are allowable for at least the same reasons as the claims from which they depend.

Regarding the dependent claims 3, 7, 10 and 14, these claims are also allowable for the following additional reasons.

Kobilansky only teaches, at best, that motion estimation should take into account the proximity to a color. In particular, in paragraph [0015], Kobilansky teaches a motion estimating technique that computes displacement vectors for regions in an image, ensuring that a "region r of a reference image is reasonably well mapped to a region r+d(r) of a target frame." Kobilansky merely says that the "region r+d(r) in target frame should have image properties like . . . color close to those of the region r in the reference frame." Kobilansky does not teach generating a single channel image based on a desired characteristic where that desired characteristic is color proximity. None of the evidence relied upon in the Final Office Action supports such a finding. Moreover, there is no evidence to support a finding that Kobilansky teaches or suggests any modification to Sasaki that could replace Sasaki's computation of edges with some calculation (not taught by Kobilansky) of color proximity.

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Accordingly, claims 3, 7, 10 and 14 are distinguishing over Sasaki (or Sasaki and Von Brandt) and Kobilanksy.
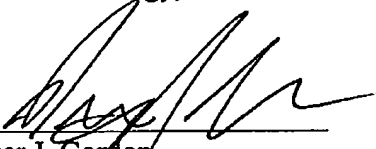
CONCLUSION

In view of the foregoing amendments and remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes, after this reply, that the application is not in condition for allowance, the Examiner is requested to call the Applicants' attorney at the telephone number listed below.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicants hereby request any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, please charge any fee to **Deposit Account No. 50-0876.**

Respectfully submitted,

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